

# Acromioclavicular Dislocations

## Open Reduction with Screw Fixation

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FOR TREATMENT of acromioclavicular dislocations, we have found that the Bosworth screw technique,<sup>1,2</sup> as modified to fit our circumstances, has been most successful. This report is to outline the technique as adapted for use by the orthopedic department of the Palo Alto Medical Clinic, and the results obtained.

The acromioclavicular joint is very resistant to trauma. Maintained in position as it is by a well-developed joint capsule and held down with its two ligaments, the conoid and the trapezoid, it resists stress from various directions. When there is subluxation of the joint, there is stretching or partial tearing of the capsule and possibly to some extent of the acromioclavicular ligament as well. With a complete rupture, the acromioclavicular ligament, capsule and coracoclavicular ligaments are torn. Mild sprains and subluxations are treated conservatively. It is with complete dislocation that we are dealing in this report.

At the Palo Alto Medical Clinic, patients with complete dislocations have been athletes, most commonly. We have taken care of the medical needs of the Stanford University students for many years; and Dr. Fritz Roth, who has been the football team physician at Stanford since 1926, originally used the Bosworth technique in 1946 and recommended it to us, emphasizing that any laxity in the joint and supporting ligaments remaining after treatment may constitute a painful handicap to all athletes and especially football players. In his extensive experience, conservative treatment had proved inadequate for complete dislocations.

The operation was formerly done under local anesthesia, with the patient in a sitting position. However, we have found this position rather cumbersome and awkward. We therefore place the patient supine, under general anesthesia, with the shoulder and arm, in sterile drapes, free on the table. The coracoid process is identified by palpation. The incision is then made from the acromial margin and along the anterior border of the clavicle to the mid-shaft. Arthrotomy is done to permit replacement and repair or removal of torn capsule which is usually

• Athletes with complete separation of the acromioclavicular joint were uniformly restored to full athletic competence by an operation consisting of direct repair of the involved ligamentous structures with temporary fixation by a metallic lag screw approximating the clavicle to the coracoid. The metallic fixation was left in place an average of eight weeks and the screw was then removed under local anesthesia. A number of professional and collegiate football players returned to the rigors of football with no discomfort or disability.

found displaced into the joint. We believe that stronger and more physiologic healing then occurs. By subperiosteal reflection of the deltoid from the anterior border of the clavicle, the coracoid process is exposed. The dislocation is then reduced.

Following the reduction, a drill-hole is made in the clavicle, large enough to permit easy insertion of a metallic lag screw with a broad flat head. It should be possible for the bare shank of the screw to move slightly in the hole in the clavicle. Then a small hole may be made in the base of the coracoid process with a drill or an awl to facilitate the entrance of the screw. The usual length of the lag screw is one and one-half inches. The screw is inserted as vertically as possible and to the extent that it penetrates the inferior cortex of the coracoid process. The margins of the acromioclavicular joint are brought into proper relationship by adjusting the screw under direct inspection and palpation. The capsule of the acromioclavicular joint is then easily repaired. Occasionally, one may also suture the coracoclavicular ligament. The patient carries his arm in a sling for several days and then is allowed free motion below 90 degrees abduction.

We have found this method safe and most successful. Since shoulder movements are carried out almost immediately after operation, there is usually no loss of motion. If the patient is an athlete, he is allowed to jog within a matter of days to keep in condition. The screw is removed later. The time between insertion and removal has varied from 31 to 108 days, but we now feel it can be removed safely after 42 days. It should be noted that if the screw is left in place too long, bone forms around

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the head, the drill hole in the clavicle will be worn larger, and there is more calcium formation around the coracoclavicular ligament.

The operation described was done in 22 cases. In 18 cases the injury was received in football, basketball or wrestling, one in polo, one in a fall while drunk, and two in automobile accidents. All the patients were males. All but two were fresh injuries. The left shoulder was involved in 16 cases, the right in six. The average age of patients was 25 years, and 13 patients were under the age of 25. The average number of days the screw remained in place was 57, but, as previously noted, recently we have removed the screw in six weeks.

Complications occurred in nine cases. In one case the screw bent when the patient played basketball prematurely. Wound infection developed in two cases; in both it cleared up before the screws were removed. In two cases the wounds were torn open and healing was delayed. It should be noted that patients of the kind comprised in this series are often difficult to manage, owing to their sometimes uncontrollable desire to participate in sports and athletics. One patient had adhesive capsulitis. He was 65 years of age and the injury had been received in an automobile accident. In one case the screw, a conventional stainless steel bone screw, pulled out. The patient was operated upon again and the result

was good. The use of lag screws has obviated this difficulty. One patient complained of pain after operation but preferred not to have anything more done. He was seen two years later following a skiing accident, and no mention was made by him at that time of further difficulty with the shoulder. One patient had been treated previously elsewhere by immobilization of the joint in a cast and had continued to have pain in the shoulder that prevented his playing football. For him we supplemented the operation with a fascial graft to reconstruct the coracoclavicular ligament. The patient later was a first-string college football player.

One football player who had the operation became one of Stanford's greatest passers, using the shoulder that had been operated upon. Two patients who were professional football players successfully continued football careers, one having returned to play the same season he was injured. In only one case in the series, that of the elderly patient with adhesive capsulitis, was there limitation of motion.

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#### REFERENCES

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